طلاطم خیز موجوں سے وہ گھبرایا نہیں کرتے

ارادے جن کے پختہ ہوں نظر جن کی خدا پر ہو

9th class

Numerical

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تمام پنجاب بورڈ کے لیے

خواب نہیں بلکہ حقیقت

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NUMERICAL:9

CHAPPTER # 01

Exp: 1, 2, 4

1.1

(a) 5000g
= 5×10^3g
= 5kg

(b) 2000000W
= 2×10^6W
= 2MW

(c) 52×10^{-10}kg
= $52\times10^{-10}\times10^3$g
= 52×10^{-7}g
= 5.2×10^{-6}g
= 5.2ug

(d) 225×10^{-10}s
= 2.25×10^{-6}s
= 2.25us

1.2

$1p=10^{-12}$	$1n=10^{-9}$
$1u=10^{-6}$	$1u=10^3n$
$1n=10^3$	$1u=10^6p$

1.3

بال بڑھنے کی شرح
= V = d/t
= 1mm/1 day
= $1\times10^{-3}/86400$
= $1.157\times10^{-5}\times10^{-3}$
= 1.157×10^{-8}
= 11.57×10^{-9}
= 11.57nm/s

1.4

(a) 1168×10^{-27}
= $1.168\times10^{-27+3}$
= 1.168×10^{-24}

(b) 32×10^5
= $3.2x^{5+1}$
= 3.2×10^6

(c) 725×10^{-5}kg
= $725\times10^{-5}\times10^3$g
= 725×10^{-2}g
= 7.25g

(d) 0.02×10^{-8}
= $2\times10^{-8-2}$
= 2×10^{-10}

1.5

(a) 6400km
= 6.4×10^3km

(b) 380000km
= 3.8×10^5km

(c) 300000000m/s
= 3×10^8m/s

(d) ایک دن میں سیکنڈز =
24x60x60s
= 86400s
= 8.64×10^4s

1.6

زیرو ایرر = 0.01x4
= 0.04cm
زیرو کوریکشن = -0.04cm

1.7

درجوں کی تعداد = 50
سکریو کی پچ = 0.5mm
L.C = پچ/درجے
= 0.5/50
= 0.01cm

1.8

0.00309kg = 3
5.05×10^{-27} = 3

1.9

1.009m = 4
0.00450kg = 3
1.66×10^{-27}kg = 3
2001s = 4

1.10

لمبائی = 6.7cm
چوڑائی = 5.4cm
رقبہ = LxW = 6.7x5.4
= 36.78cm²
= 36cm²

CHAPPTER # 02

Exp: 2,3,4,5,10,11

2.1

V = 36km/h
= 36x1000m/3600
V =10m/s
t = 10s
S = Vxt
=10x10
= 100m

2.2

$V_i = 0$
S = 1000m
t = 100s
V_f =?
$S = V_it + \frac{1}{2}at^2$
$10^3=0\times100+\frac{1}{2}\times a\times(100)^2$
a = 0.2m/s²
$V_f = V_i + at$
= 0 + 0.2x100
= 20m/s

2.3

V_i = 10m/s
a = 0.2m/s²
t = 30s
S = ?
V_f = ?
$V_f = V_i + at$
= 10+0.2x30
= 10+6 = 16m/s
$S = V_it + \frac{1}{2}at$
= $10\times30+\frac{1}{2}0.2(30)^2$
= $300+\frac{1}{2}0.2\times900$
= 300+90
= 390m

2.4

V_i = 30m/s
V_f = 0
g = -10m/s²
h = ?
$2gh = V_f^2 - V_i^2$
$2(-10)h=(0)^2-(30)^2$
-20h = -900
h = -900/-20
h = 45m
واپسی کا ٹائم = t = 3s

2.5

پانچ سیکنڈ میں طے فاصلہ
V_i = 40m/s
t = 5s
S_1 = Vxt
S_1 = 40x5
= 200m

دس سیکنڈ میں طے فاصلہ
V_i = 40m/s
V_f = 0
t = 10s
$V_{av} = V_f+V_i/2$
= 0+40/2
= 20m/s
S_2 = Vxt
S_2 = 20x10
= 200m
کل فاصلہ = $S_1 + S_2$
= 200 + 200
= 400m

ڈیسلریشن
$a_{av} = V_f-V_i/t$
= 0-40/10 = -40/10
= -4m/s²

2.6

Vi = 0
a = 0.5m/s2
S = 100m
V_f = ?
$2aS = V_f^2 - V_i^2$
$2(0.5)100=V_f^2-(0)^2$
V_f^2 = 100
V_f = 10m/s²
V_f = 10x3600/1000
V_f = 36km/h

2.7

دو منٹ میں طے فاصلہ
V_i = 0
V_f = 48km/h
= 13.33m/s
t = 2mint=2x60
= 120s
$V_{av} = V_f-V_i/2$
= 0+13.33/2
= 6.66m/s
$S_1 = V_{av}xt$
= 6.66x120
= 800m

پانچ منٹ میں طے فاصلہ
V = 13.33m/s
t = 5mint = 5x60
= 300s
S_2 = Vxt
= 13.66x300
= 4000m

تین منٹ میں طے فاصلہ
V_i = 13.66m/s
V_f = 0
t = 3mint = 3x60
= 180s
$V_{av} = V_f+V_i/2$
= 0+13.66/2
= 6.66m/s
$S_3 = V_{av}xt$
= 6.66x180
= 1200m
کل فاصلہ = $S_1+S_2+S_3$
= 800+4000+1200
= 6000m

2.8

اوپر جانے کا وقت
t = 6/2 = 3s
g = -10m/s²
V_f = 0
h = ?
V_i = ?
$V_f = V_i + gt$
$0 = V_i + (-10)\times3$
V_i = 30m/s
$2gh = V_f^2-V_i^2$
$2(-10)h=(0)2-(30)2-20xh=-900$
h = -900/-20
= 45m

2.9

S = 800m
V_i = 96km/h
= 26.67m/s
V_f = 48km/h
= 13.33m/s
a = ?
$2aS = V_f^2-V_i^2$
$2a800=(13.33)^2-(26.67)^2$
1600a=177.68-711.28
a = -533.6/1600
= -0.3335m/s²

اس ایکسلریشن سے طے فاصلہ
V_i = 13.33m/s
V_f = 0
a = -0.3335m/s²
S = ?
$2aS = V_f^2-V_i^2$
$2(-0.3335)S=(0)^2-(13.33)^2$
0.667xS = -177.66

$S = -177.66/-0.667$
$S = 266.4m$

2.10
$V_i = 26.67m/s$
$V_f = 0$
$a = -0.3335m/s^2$
$V_f = V_i + at$
$t = Vf\text{-}Vi/a$
$t = 0\text{-}26.67/\text{-}0.3335$
$t = 80s$

CHAPPTER # 03

Exp: 1, 2, 3, 6, 7, 8

3.1
$F = 20N$
$a = 2m/s^2$
$F = ma$
$m = F/a$
$= 20/2$
$= 10kg$

3.2
$W = 147N$
$g = 10m/s^2$
$W = mg$
$m = W/g$
$= 147/10$
$= 14.7kg$

3.3
$m = 10kg$
$g = 10m/s^2$
$W = mg \rightarrow F$
$= 10x10$
$= 100N$

3.4
$F = 100N$
$m = 50kg$
$F = ma$
$a = F/m$
$= 100/50$
$= 2m/s^2$

3.5
$W = 20N$
$a = 2m/s^2$
$g = 10m/s^2$
$W = mg$
$m = W/g$
$= 20/10$
$= 2kg$
$F = ma$
$= 2x2 = 4N$
ساری فورس $= W+F$
$F = 20+4$
$= 24N$

3.6
بڑا ماس $m_1 = 52kg$
چھوٹا ماس $m_2 = 48kg$
$g = 10m/s^2$
$a = \frac{(m_1-m_2)g}{m_1+m_2}$
$=(52\text{-}48)x10/52+48$
$= 4x10/100=40/100$
$a = 0.4m/s^2$
$T = \frac{2m_1m_2g}{m_1+m_2}$
$= 2x52x48x10/100$
$= 49920/100$
$T = 500N$

3.7
لٹکا ہوا ماس $m_1 = 24k$
سطح پر پڑا ماس $m_2 = 26kg$
$g = 10m/s^2$
$a = \frac{m_1g}{m_1+m_2}$
$= 24x10/24+26$
$a = 240/50$
$= 4.8m/s^2$
$T = \frac{m_1m_2g}{m_1+m_2}$
$=24x26x10/24+26$
$T = 6240/50$
$= 125N$

3.8
$\Delta P = 22Ns$
$F = 20N$
$F = \Delta P/t$
$t = \Delta P/F$
$= 22/20$
$t = 1.1s$

3.9
$m = 5kg$
$\mu = 0.6$
$F_s = \mu R = \mu mg$
$F_s = 0.6x5x10$
$= 30N$

3.10
$m = 0.5kg$
$r = 50cm$
$r = 50/100$
$= 0.5m$
$V = 3m/s$
$F_c = mV^2/r$
$= 0.5x(3)^2/0.5$
$= 9N$

CHAPPTER # 04

Exp: 1, 2, 5

4.1
$F_x = 10\text{-}4 = 6N$
$F_y = 6N$
$F = \sqrt{F_x^2 + F_y^2}$
$F = \sqrt{6^2 + 6^2}$
$F = \sqrt{72} = 8.5N$
$\theta = \tan^{-1}(F_y/F_x)$
$\theta = \tan^{-1}(6/6)$
$\theta = \tan^{-1}(1)$
$= 45^0$

4.2
$F = 50N$
$\theta = 30^0$
$F_x = F\cos\theta$
$= 50\cos30^0$
$= 50x0.866$
$= 43.3N$
$F_y = F\sin\theta$
$= 50\sin30^0$
$= 50x0.5$
$= 25N$

4.3
$F_x = 12N$
$F_y = 5N$
$F = \sqrt{F_x^2 + F_y^2}$
$F = \sqrt{12^2 + 5^2}$
$F = \sqrt{169} = 13N$
$\theta = \tan^{-1}(F_y/F_x)$
$\theta = \tan^{-1}(5/12)$
$= 22.6^0$

4.4
$F = 100N$
$r = 10cm = 0.1m$
$\tau = rF$
$= 0.1x100$
$= 10Nm$

4.5
$F_x = 20N$
$\theta = 30^0$
$F_x = F\cos\theta$
$F = F_x/\cos\theta$
$= 20/\cos30^0$
$= 20/0.866$
$= 23.1N$

4.6
$F = 50N$
$r = 16cm = 0.16m$
کپل کا ٹارک
$\tau = 2rF$
$= 2x0.16x50$
$= 16Nm$

4.7
$T_1 = 3.8N$
$T_2 = 4.4N$
$W = T_1 + T_2$
$= 3.8+4.4$
$= 8.2N$

4.8
$m_1 = 3kg$
$m_2 = 5kg$
$T_1 = mg$
$= 3x10$
$= 30N$
$T_2 = (m_1+m_2)g$
$= (3+5)x10$
$= 80N$

4.9
$F_1 = 200N$
$r_1 = 20cm = 0.2m$
$F_2 = 150N$
$r_2 = ?$
$\tau_1 = \tau_2$
$F_1r_1 = F_2r_2$
$r_2 = F_1r_1/F_2$
$= 0.1x200/150$
$= 0.133m$
$= 13.3cm$

4.10
$m = 10kg$
$F_1 = mg$
$F_1 = 10x10 = 100N$
$r_1 = 20cm = 0.2m$
$r_2 = 50cm = 0.5m$
$F_2 = ?$
انٹی کلاک وائز = کلاک وائز ٹارک
$F_2r_2 = F_1r_1$
$F_2 = F_1r_1/r_2$
$= 100x0.2/0.5$
$= 20/0.5$
$= 40N$

CHAPPTER # 05

Exp: 1, 2

5.1
$m_1 = 1000kg$
$m_2 = 1000kg$
$d = 0.5m$
$G = 6.67x10^{-11}Nm^2kg^{-2}$
$F = Gm_1m_2/d^2$
$= Gx10^3x10^3/(0.5)^2$
$=6.67x10^{-11}x10^6/0.25$
$= 26.7x10^{-11+6}$
$= 26.7x10^{-5}$
$= 2.67x10^{-4} N$

5.2
$m = m_1 = m_2 =?$
$F = 0.006673N$
$d = 1m$
$G = 6.67x10^{-11}Nm^2kg^{-2}$
$F = Gm_1m_2/d^2$
$m^2 = Fxd^2/G$
$= \frac{0.006673(1)^2}{6.673x10\text{-}11}$
$= \frac{6.673x10^{-3}}{6.673x10^{-11}}$
$m^2 = 1x10^{-3+11}$
$= 10^8$
$\sqrt{m^2} = \sqrt{(10^4)^2}$
$m = 10000kg$

5.3
$M_m = 6.42x10^{23}kg$
$R_m = 3370km$
$= 3.370x10^6m$
$G = 6.67x10^{-11}Nm^2kg^{-2}$
$g_m = GM_m/R^2$
$= \frac{6.673x10^{-11}x6.42x10^{23}}{(3.370x10^6)^2}$
$= \frac{42.84x10^{23-11}}{11.35x10^{12}}$
$= 3.77x10^{12-12}$
$= 3.77x10^0$
$g_m = 3.77m/s^2$

5.4
$g_m = 1.62m/s^2$
$R_m = 1740km$

$= 1.740\times10^{6}m$
$G = 6.67\times10^{-11}Nm^2kg^{-2}$
$M_m = g_mR^2/G$
$= \frac{1.62\times(1.74\times10^6)^2}{6.673\times10^{-11}}$
$= \frac{1.62\times3.027\times10^{12}}{6.673\times10^{-11}}$
$= \frac{4.904712\times10^{12+11}}{6.673}$
$= 0.735\times10^{23}$
$M_m = 7.35\times10^{22}kg$

5.5
$h = 3600km$
$= 3.6\times10^6m$
$R = 6.4\times10^6m$
$M_e = 6\times10^{24}kg$
$g_m = GM/(R+h)^2$
$= \frac{6.67\times10^{-11}\times6\times10^{24}}{(6.4\times10^6+3.6\times10^6)^2}$
$= \frac{40.038\times10^{24-11}}{[(6.4+3.6)\times10^6]^2}$
$= \frac{40.038\times10^{13}}{(10\times10^6)^2}$
$= \frac{40.038\times10^{13}}{100\times10^{12}}$
$= 0.4\times10^{13-12}$
$= 0.4\times10^1$
$g_m = 4m/s^2$

5.6
$R = 48700km$
$= 48.7\times10^6m$
$g = GM/R^2$
$= \frac{6.67\times10^{-11}\times6\times10^{24}}{(48.7\times10^6)^2}$
$= \frac{40.038\times10^{24-11}}{2371.69\times10^{12}}$
$= 0.017\times10^{13-11}$
$= 0.017\times10^1$
$g = 0.17m/s^2$

5.7
$R = 10000km$
$= 10^7m$
$g = 4m/s^2$
$M_e = gR^2/G$
$= \frac{4\times(10^7)^2}{6.67\times10^{-11}}$
$= 0.599\times10^{14+11}$
$= 0.599\times10^{25}$
$M = 5.99\times10^{24}kg$

5.8
$g_h = ¼\,g$
$g_h = GM/(R+h)^2$
$(R+h)^2 = GM/g_h$
$= GM/\,¼\,g$
$(R+h)^2 = 4GM/g$
دونوں طرف جذر لی
$\sqrt{(R+h)^2} = \sqrt{4GM/g}$
$R+h = \sqrt{4R^2}$
$R+h = 2R$
$h = 2R-R$
$h = R$

5.9
$h = 850km$
$h = 0.85\times10^6m$
$V_0 = (GM/R+h)^{1/2}$
$= \frac{(6.673\times10^{-11}\times6\times10^{24})^{1/2}}{(0.85\times10^6+6.4\times10^6)^{1/2}}$
$= \frac{(40.038\times10^{13})^{1/2}}{[(0.85+6.4)10^6]^{1/2}}$
$= \frac{(40.038\times10^{13-6})^{1/2}}{(7.25)^{1/2}}$
$= (5.522\times10^7)^{1/2}$
$= (55.22\times10^6)^{1/2}$
$= 7.431\times10^3$
$V_0 = 7431m/s$

5.10
$h = 42000km$
$= 42\times10^6m$
$V_0 = (GM/R+h)^{1/2}$
$= \frac{(6.673\times10^{-11}\times6\times10^{24})^{1/2}}{(42\times10^6+6.4\times10^6)^{1/2}}$
$= \frac{(40.038\times10^{24-11})^{1/2}}{[(42+6.4)10^6]^{1/2}}$
$= \frac{(40.038\times10^{13-6})^{1/2}}{(48.4)^{1/2}}$
$= (0.8272\times10^7)^{1/2}$
$= (8.272\times10^6)^{1/2}$
$= 2.876\times10^3$
$V_0 = 2876m/s$

CHAPPTER # 06

Exp: 1, 2, 3, 4, 5

6.1
$F = 300N$
$d = 35m$
$W = Fd$
$= 300\times35$
$= 10500J$

6.2
$W = mg = 20N$
$h = 6m$
$P.E = mgh$
$= 20\times6$
$= 120J$

6.3
$W = 12kN$
$= 12000N$
$V = 20m/s$
$W = mg$
$m = W/g$
$= 12000/10$
$= 1200kg$
$K.E = ½mV^2$
$= ½\times1200\times(20)^2$
$= 600\times400$
$= 240000$
$= 240\times10^3$
$= 240kJ$

6.4
$m = 500g$
$= 0.5kg$
$V = 15m/s$
$K.E = ½mV^2$
$= ½\times500\times(0.5)^2$
$= 0.5\times225/2$
$K.E = 56.25J$
کنزرویشن آف انرجی کے قانون کے مطابق
$K.E = P.E$
$P.E = 56.25J$

6.5
$h = 6m$
$V = 1.5m/s$
$m = 40kg$
$P.E = mgh$
$= 40\times10\times6$
$= 2400J$
$K.E = ½mV^2$
$= ½\,40\times(1.5)^2$
$= 20\times2.25$
$= 45J$

6.6
$V = 4m/s$
$F = 4000N$
$P = W/t = F.d/t$
$P = FV$
$= 4000\times4$
$= 16000W$
$= 16kW$

6.7
$F = 300N$
$d = 50m$
$t = 60s$
$P = W/t = F.d/t$
$P = 300\times50/60$
$= 250W$

6.8
$m = 50kg$
$t = 20s$
سیڑھی کی لمبائی $= 16cm$
$= 16/100 = 0.16m$
سیڑھیوں کی تعداد $= 25$
$h = 25\times0.16 = 4m$
$P = W/t = mgh/t$
$= 50\times10\times4/20$
$= 100W$

6.9
$m = 200kg$
$h = 6m$
$t = 10s$
$P = W/t = mgh/t$
$= 200\times10\times6/10$
$= 1200W$

6.10
$m = 800kg$
$P = 1hp = 746W$
$t = 10mint = 600s$
$h = 15m$
$P = W/t$
$W = Pxt$
$= 746\times600$
$input = 447600J$
$W = mgh$
$= 800\times10\times15$
$output = 120000J$
$E_f = (output/input)100$
$= \frac{120000}{447600}\times100$
$E_f = 26.8\%$

CHAPPTER # 07

Exp: 1, 2

7.1
$m = 850g$
$= 850/1000 = 0.85kg$
$V = 40cm\times10cm\times5cm$
$= \frac{40m}{100}\times\frac{10m}{100}\times\frac{5m}{100}$
$= 0.4m\times0.1m\times0.05m$
$V = 0.002m^3$
$\rho = m/V$
$= 0.85/0.002$
$= 425kg/m^3$

7.2
$m = 1L = 1kg$
$\rho = 0.92kg/L$
$V = m/\rho$
$= 1/0.92 = 1.09L$

7.3
(a) $m = 5kg$
$\rho = 8200kg/m^3$
$V = m/\rho = 5/8200$
$= 6.01\times10^{-4}m^3$
(b) $m = 200g$
$= 200/1000 = 0.2kg$
$\rho = 11300kg/m^3$
$V = m/\rho = 0.2/11300$
$= 1.77\times10^{-5}m^3$
(c) $m = 0.2kg$
$\rho = 19300kg/m^3$
$V = m/\rho = 0.2/19300$
$= 1.04\times10^{-5}m^3$

7.4
$\rho = 1.3kg/m^3$
$V = 8m\times5m\times4m$
$= 160m^3$
$m = \rho\times V$
$= 160\times1.3$
$= 208kg$

7.5
$F = 75N$
$A = 1.5cm^2$
$(1m)^2 = (100cm)^2$
$1/10^4m^2 = 1cm^2$
$1.5cm^2 = 0.00015m^2$
$P = F/A$
$= 75/0.00015$
$= 5\times10^5Pa$

7.6
$L = 10mm$
$= 10/1000 = 0.01m$
$A = L\times L = 0.01\times0.01$
$= 1\times10^{-4}m^2$

$F = 20N$
$P = F/A = 20/10^{-4}$
$= 2\times10^5 N/m^2$

7.7
$m=1000g=1kg$
$A = 7.5cm \times 7.5cm$
$= \frac{7.5m}{100} \times \frac{7.5m}{100}$
$= 0.075m \times 0.075m$
$A = 0.005625m^2$
$F = mg$
$= 1\times10 = 10N$
$P = F/A$
$= 10/0.005625$
$= 1778N/m^2$

$V = \frac{20cm}{100} \times \frac{7.5cm}{100} \times \frac{7.5cm}{100}$
$= 0.2m \times 0.075m \times 0.075m$
$V = 0.001125m^3$
$\rho = m/V$
$= 1/0.001125$
$= 888.89kg/m^3$

7.8
کیوب کے ماس اور ڈینسٹی کے لحاظ سے اس کا اصل والیوم
$m = 306g$
$\rho = 2.55g/cm^3$
$V_0 = m/\rho$
$= 306/2.55$
$= 120cm^3$
کیوب کی شکل کی وجہ سے اس کا والیوم
$V_s = 5\times5\times5 = 125cm^3$
کیویٹی کا والیوم $= V_c = V_s - V_0$
$V_c = 125-120 = 5cm^3$

7.9
$W_{air} = 18N$
$W_{water} = 11.4N$
$D = (W_{air}/W_{air} - W_{wat})\rho$
$D = (18/6.6)\times1000$
$= 2727kg/m^3$ (Al)

7.10
$W = 3.06N$
$m = W/g = 3.06/10$
$= 0.306kg = 306g$
$\rho = 0.6g/cm^3$
(a) $V = m/\rho$
$= 306/0.6 = 510cm^3$
(b) $V = m/\rho$
$= 306/0.9 = 340cm^3$

7.11
$F_2 = 20000N$
پریس کے پسٹن کا ایریا
$D = 30cm$
$R = D/2 = 30/2$
$= 15cm = 0.15m$
$A = \pi R^2$
$= 3.14\times(0.15)^2$
$= 0.07065m^2$
پمپ کے پسٹن کا ایریا
$d = 3cm$
$r = d/2 = 3/2$
$= 1.5cm = 0.015m^2$
$a = \pi r^2$
$= 3.14\times(0.015)^2$
$= 0.0007065m^2$
$F_2/A = F_1/a$
$F_1 = F_2 \times a/A$
$= \frac{20000\times0.0007065}{0.07065}$
$F_1 = 14.13/0.07065$
$F_1 = 200N$

7.12
$A = 2\times10^{-5}m^2$
$F = 4000N$
اصل لمبائی $= L = 2m$
$\Delta L = 2mm$
$= 2/1000 = 0.002m$
$Y = F\times L/A\times\Delta L$
$= 4000\times2/2\times10^{-5}\times.002$
$= 8000/4\times10^{-8}$
$Y = 2\times10^{11}N/m^2$

CHAPPTER # 08

Exp: 1, 2, 3, 4

8.1
$C = 50^0C$
$F = 1.8^0C+32$
$= 1.8\times50+32$
$F = 122^0F$

8.2
$F = 98.6^0F$
$C = (F-32)/1.8$
$= (98.6-32)/1.8$
$= 37^0C$
$K = C+273$
$= 37+273$
$= 310K$

8.3
$L_0 = 2m$
$T_1 = 0^0C = 273K$
$T_2 = 20^0C = 293K$
$\alpha = 2.5\times10^{-5}K^{-1}$
$\Delta L = \alpha L_0(T_2-T_1)$
$= 2.5\times10^{-5}\times2(293-273)$
$= 2.5\times10^{-5}\times2(20)$
$= 2.5\times40\times10^{-5}$
$= 100/10^5$
$= 0.001m = 0.1cm$

8.4
$V_0 = 1.2m^3$
$T_1 = 15^0C = 288K$
$T_2 = 40^0C = 313K$
$\beta = 3.67\times10^{-3}K^{-1}$
$V = V_0(1+\beta\Delta T)$
$= 1.2[1+3.67\times10^{-3}(313-288)]$
$= 1.2[1+3.67\times10^{-3}(25)]$
$= 1.2[1+0.09175]$
$V = 1.3m^3$

8.5
$m = 0.5kg$
$T_1 = 10^0C = 283K$
$T_2 = 65^0C = 338K$
$C = 4200J/kgK$
$\Delta Q = Cm\Delta T$
$= 0.5\times4200(338-283)$
$= 05\times4200\times55$
$\Delta Q = 115500J$

8.6
$\Delta Q = 1000J/s$
$m = 200g = 0.2kg$
$T_1 = 20^0C = 293K$
$T_2 = 90^0C = 363K$
$Q = Cm\Delta T/t$
$t = 4200\times0.2(363-293)/Q$
$t = 840(70)/1000$
$t = 58800/1000$
$t = 58.8s$

8.7
$\Delta Q = 50000J$
$H_f = 336000J/kg$
$\Delta Q = H_f m$
$m = \Delta Q/H_f$
$m = 50000/336000$
$= 0.149kg$
$= 150g$

8.8
$m=100g=0.1kg$
برف کو گرم کرنے کے لیے درکار حرارت
$Q_1 = Cm\Delta T$ $(-10\rightarrow0)$
$= 2100\times0.1[0-(-10)]$
$Q_1 = 2100J$
برف کو پگھلانے کے لیے درکار حرارت
$Q_2 = mH_f$ (@ 0^0C)
$= 0.1\times336000$
$Q_2 = 33600J$
پانی کو گرم کرنے کے لیے درکار حرارت
$Q_3 = Cm\Delta T$ $(0\rightarrow10)$
$= 4200\times0.1(10-0)$
$Q_3 = 4200J$
کل حرارت $= Q_1+Q_2+Q_3$
$= 2100+33600+4200$
$Q = 39900J$

8.9
$T = 100^0C$
$m = 100g = 0.1kg$
$H_v = 2.26\times10^6 J/kg$
$\Delta Q = mH_v$
$= 0.1\times2.26\times10^6$
$= 2.26\times10^5 J$

8.10
$m_{steam} = 5g$
$= 5/1000 = 0.005kg$
$m_{water} = 500g$
$= 500/1000 = 0.5kg$
پانی کی پہلے ٹمپریچر سے آخری ٹمپریچر تک اپنے ماس کے لحاظ سے جذب کردہ حرارت
$Q_p = Cm\Delta T$
$= Cm(T_2-T_1)$
$= 2100\times0.5(T_2-10)$
$= 2100T_2-21000$
ماس کے لحاظ سے بھاپ کی خارج کردہ حرارت
$Q = mH_v$
$= 0.005\times2.26\times10^6$
$= 11300J$
بھاپ کی پہلے ٹمپریچر سے آخری ٹمپریچر تک جاتے ہوئے خارج کردہ حرارت
$Q = Cm\Delta T$
$= 4200\times0.005(100-T_2)$
$= Q = 2100-21T_2$
پانی کی جذب کردہ حرارت = بھاپ کی خارج کردہ حرارت
$2100T_2-2100=$
$11300+2100-21T_2$
$2100T_2+21T_2=$
$11300+2100+21000$
$2121T_2 = 34400$
$T_2 = 34400/2121$
$T_2 = 16.21^0C$

CHAPPTER # 09

9.1
$A = 200m^2$
$L = 20cm = 0.2m$
$T_1 = 15^0C = 288K$
$T_2 = 35^0C = 308K$
$k = 0.65 W/mK$
$Q/t = kA(T_2-T_1)/L$
$= \frac{0.65\times200(308-288)}{0.2}$
$= 130\times(20)/0.2$
$= 13000J/s$

9.2
$A = 2\times2.5 = 5m^2$
$L = 0.8cm = 0.008m$
$t = 1hr = 3600s$
$T_1 = 5^0C = 278K$
$T_2 = 25^0C = 298K$
$k = 0.8 W/mK$
$Q = kA(T_2-T_1)\times t/L$
$= \frac{0.8\times5(298-278)\times3600}{0.008}$
$= 4(20)3600/0.008$
$= 288000/0.008$
$= 36000000$
$Q = 3.6\times10^7 J$

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